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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/613,527 | 07/10/2000 | Hiroaki Sudo | JEL 31211 | 9543 |

7590

09/10/2003

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EXAMINER

SEFCHECK, GREGORY B

ART UNIT

PAPER NUMBER

2662

DATE MAILED: 09/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/613,527

Applicant(s)

SUDO, HIROAKI

Examiner

Gregory B Sefcheck

Art Unit

2662

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 July 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2, 4, 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed October 10, 2000 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. The information referred to therein has not been considered.

Examiner's Note: IDS filed July 10, 2000 contained the reference publication "Multi-Carrier DS-CDMA using Frequency Spread Coding" with an English Abstract. The IDS filed October 10, 2000 claimed the same reference with English translation of pg. 1-3, but a copy of the reference was not provided.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a) because they fail to show how the input Known Signal, P_i , is received by the residual phase error detection section (Fig. 6; Fig. 4, element 113). Only the input of the Known Signal (after de-spreading) is shown and described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. The abstract of the disclosure is objected to because it exceeds the maximum word count of 150. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4, 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miya (US006175558B1).
4. In regards to Claim 1 and 6 (transmitter/transmission method having first spreader/spreading step for processing plurality of transmission data signals using different codes, second spreader/spreading step for processing known signal with a different code, transmitter/transmitting step for transmitting after multiplexing spread signals using FDM),

With reference to Fig. 4, Miya discloses a CDMA transmitting device/transmission method comprising:

- Spreaders 103-1 through 103-N (first spreader/spreading step) for spreading transmission data signals 1-N using different spread codes 1-N (Col. 4, lines 30-32).

- A second spreader/spreading step 103-0 using a different spreading code 0 (Col. 5, lines 13-17) used to spread a pilot signal (known signal).
- Multiplex circuit 106 for multiplexing the spread signals before being transmitted/transmitting step.

In regards to Claim 3 and 7 (receiver/reception method for receiving a transmission signal as described in claim 1 comprising a first demodulator/demodulating step for de-spreading transmission data signals, second demodulator/demodulating step for de-spreading a known signal, phase error detector/detecting step using known signal and received known signal, and phase compensator/compensating step for each reception signal using phase error),

With reference to Fig. 7, Miya discloses a receiver/receiving step for receiving the transmitted signal of Claim 1 comprising:

- Inverse spreading circuit/spreading step 403 using spreading codes 1-N (first demodulator/demodulating step) for extracting (de-spreading) each transmission data signal.
- Inverse spreading circuit/spreading step 403 using spreading code 0 (second demodulator/demodulating step) of the pilot signal (known signal) extracts the pilot signal from the received signal (Col. 5, lines 55-56).
- A line condition inference circuit 406 (phase error detector/detecting step) infers phases (residual phase error) of the received signal using the received PL signal and the period of the PL signal (Col. 5/6, lines 55-5).

- A synchronous detection circuit 407 (phase compensator/compensating step) uses the phase information (residual phase error) inferred from the PL signal to synchronize (phase compensate) each of the plurality of transmission signals (Col. 6, lines 1-5).

In regards to Claim 1, Miya does not disclose that frequency division multiplexing is used to multiplex the spread signals into orthogonalized phases prior to transmission.

In regards to Claim 3, Miya also does not disclose that the received signal has been frequency division multiplexed.

Miya does disclose separating the spread signals into orthogonalized phases (Col. 10, lines 39-52) before transmission. The use of orthogonal frequency division multiplexing (OFDM) is a well-known method for spreading signals into orthogonalized phases.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the transmission and reception devices of Miya by applying orthogonal frequency division multiplexing transmission/reception, thereby providing the orthogonalized phase separation disclosed in Miya which serves to reduce interference between the spread signals and enhance reliability of the pilot signal.

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5. In regards to Claim 2 (known signal's signal level is higher than level of transmission data signals),

Miya discloses a PL signal (known signal) that is transmitted in a strong electric power compared to a channel transmitting other information data (Col. 2, lines 8-11; Col. 6, lines 39-57).

6. In regards to Claim 4 (communications terminal apparatus comprising the transmitter of Claim 1 and the receiver of Claim 2),

Miya discloses both the transmission and reception devices claimed by the applicant, as shown above in addressing Claims 1 and 3.

Miya does not expressly state that the transmission device and reception device are coupled into a single communications terminal apparatus.

The advantages of combining the functionality of the receiving and transmitting devices are obvious. Both devices share common elements such as the spreading/de-spreading codes and recognition of the PL signal period (Col. 5, lines 54-59).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the transmission and reception devices of Miya into a single base station/communications terminal in order to benefit from the shared components of the two devices and reduce implementation costs.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miya (US006175558B1) in view of Sunaga (US006381233B1).

8. In regards to Claim 5 (base station apparatus in radio communication with communication terminal apparatus of Claim 4),

Miya discloses a transmission and reception device as described in Claims 1/3. Miya further discloses the obvious combining of these two devices into a communications terminal as shown above in response to Claim 4.

Miya does not show the communications terminal in radio communication with a base station apparatus.

Sunaga discloses a spread spectrum communication transmitter and receiver and a CDMA communication system. In Fig. 4, Sunaga shows the CDMA mobile communication system having a mobile station 25 (communication terminal apparatus) in radio communication with base stations 21-24 (Col. 2, lines 25-34).

It would have been obvious to one of ordinary skill in the art at the time of the invention to adapt the communications terminal of Miya to be in radio communication with a base station apparatus, as shown by Sunaga. This would allow the communications terminal to receive updated information from the base station as well as communicate with other communications terminals that are also in communication with the base station.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

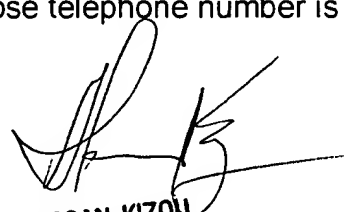
- Unno (US006519244B1) discloses a CDMA transmitter capable of reducing transmission power
- Park et al. (US006442152B1) discloses a device and method for communicating packet data in mobile communication system
- Ozluturk et al. (US006366607B1) discloses processing for improved performance and reduced pilot

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory B Sefcheck whose telephone number is 703-305-0633. The examiner can normally be reached on 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on 703-305-4744. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

9-5-2003
GBS


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